Applicant: Meggiolan
Application No.: 10/073,405

IN THE CLAIMS

1. (currently amended) Method for fabricating a bicycle wheel hub, comprising the following steps:

-providing an expandable core,

-applying a number of layers of structural ~~fibre~~ fiber fabric incorporated in a plastic material matrix around the core to form a layered tubular body of predetermined shape and thickness around the core,

-arranging the core with the layered tubular body formed thereon in the cavity of a ~~mould~~ mold,

-increasing the temperature of the ~~mould~~ mold to a value sufficient to cause reticulation of the plastic material matrix,

-expanding the core due to the temperature increasing step, which applies a pressure on the tubular body against the inside the ~~mould~~ mold, and

-removing the tubular body from the ~~mould~~ mold and from the core, so as to obtain a bicycle hub formed of a single piece of structural ~~fibre~~ fiber material.

2. (currently amended) Method according to claim 1, wherein the increase of temperature of the ~~mould~~ mold and the expansion of the core occur substantially simultaneously.

3. (original) Method according to claim 1, wherein the pressure on the tubular body caused by said expanding step is substantially radial.

4. (currently amended) Method according to claim 1, wherein a cooling phase is provided before removal of the tubular body from the ~~mould~~ mold.

5. (currently amended) Method according to claim 1, wherein the expandable core is made of a synthetic material presenting a thermal dilation coefficient exceeding 5x10-15 ~~mm*°C~~ 1/°C and a maximum continuous heat resistance equal to at least 80°C, the expansion of the core being obtained through the dilation of the material forming the core when the temperature of the ~~mould~~ mold is increased.

6. (currently amended) Method according to claim 5, wherein the core has a thermal dilation coefficient exceeding 9x10-5 ~~mm*°C~~ 1/°C and a maximum continuous heat resistance temperature exceeding 100°C.

7. (original) Method according to claim 6, wherein the material forming the core is either PTFE, or PCTFE, or PVDF, or PE-HD.

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8. (original) Method according to claim 7, wherein the material forming the core is PTFE.

9. (currently amended) Method according to claim 1, wherein said structural ~~fibres~~ fibers are selected among: carbon ~~fibres~~ fibers, glass ~~fibres~~ fibers, Kevlar ~~fibres~~ fibers, or any combinations thereof.

10. (original) Method according to claim 1, wherein said plastic material matrix is a thermosetting plastic material matrix.

11. (original) Method according to claim 1, wherein said temperature is comprised in the range from 80°C to 200°C.

12. (original) Method according to claim 11, wherein said temperature is maintained for a time comprised in the range from 10 minutes to three hours.

13. (original) Method according to claim 12, wherein said temperature is maintained for a time comprised in the range from 30 minutes to three hours.

14. (original) Method according to claim 1, wherein said core presents a cylindrical central section and two wider diameter end sections.

15. (currently amended) Method according to claim 1, wherein said core consists of two separate, axially contiguous elements, with a contact plane orthogonal to the axis of the core, in order to allow separation of the core from the tubular body after extraction from the ~~mould~~ mold.

16. (currently amended) Method according to claim 14, wherein also said tubular body is formed so as to present a cylindrical central section and two enlarged end sections~~ (11, 12)~~.

17. (original) Method according to claim 14, wherein said tubular body presents a progressively increasing thickness from said central section towards the ends.

18. (original) Method according to claim 14, wherein said tubular body has a central part of substantially constant section, end parts with substantially constant section, but larger that the central one and intermediate parts with increasing sections.

19. (previously presented) Method according to claim 15, wherein said two elements forming the core incorporate two end ring flanges to axially limit the ends of the pre-formed tubular body.

20-23. (withdrawn)

24. (previously presented) Method according to claim 1, wherein the layers of fabric on the core comprise one or more fabric strips wrapped around at least one axially limited portion of the core, to confer thickness to the tubular body, as well as a plurality of fabric plies extending along the core axis, to confer resistance in the axial direction to the tubular body.

25. (original) Method according to claim 24, wherein at least some of said strips have triangular cuttings on one at least one lateral edge thereof.

26. (previously presented) Method according to claim 24, wherein at least some of said strips have extensions triangular cuttings on both at least one lateral edges thereof.

27. (original) Method according to claim 24, wherein at least some of said strips have a combination of cuttings and extensions on at least one lateral edge thereof.

28. (original) Method according to claim 25, wherein said cuttings are triangular.

29. (original) Method according to claim 25, wherein said cuttings are rectangular.

30. (original) Method according to claim 25, wherein said cuttings are rectilinear.

31. (original) Method according to claim 24, wherein at least some of said strips and at least some of said plies are applied on the core alternated to each other.

32. (original) Method according to claim 31, wherein at least one of said strips is wrapped around each end portion of said core.

33. (original) Method according to claim 31, wherein at least one of said strips is wrapped around an intermediate portion of said core.

34. (original) Method according to claim 31, wherein at least some of said plies extend for the entire length of the core.

35. (original) Method according to claim 31, wherein at least some of said plies cover the core only partly in the circumferential direction.

36. (original) Method according to claim 35, wherein said plies are applied on different sides of the core for forming a complete layer on the core.

37. (original) Method according to claim 36, wherein the plies are applied in pairs on diametrically opposite sides of the core.

38. (original) Method according to claim 37, wherein different pairs of plies are applied so as to be angularly spaced relative to each other on the core.

39. (currently amended) Method according to claim 38, wherein two pairs of diametrically opposite plies are applied spaced by 90°C relative to each other.

40-45. (withdrawn)

46. (currently amended) Method for fabricating a bicycle wheel hub, comprising the following steps:

- providing an expandable core,
- applying a number of layers of structural ~~fibre~~ fiber fabric incorporated in a plastic material matrix around the core to form a layered tubular body of predetermined shape and thickness around the core,
- arranging the core with the layered tubular body formed thereon in the cavity of a ~~mould~~ mold,
- increasing the temperature of the ~~mould~~ mold to a value sufficient to cause reticulation of the plastic material matrix,
- expanding the core for applying a pressure on the tubular body inside the ~~mould~~ mold, and
- removing the tubular body from the ~~mould~~ mold and from the core, so as to obtain a bicycle hub formed of a single piece of structural ~~fibre~~ fiber material,

wherein the expandable core is made of a synthetic material presenting a thermal dilatation coefficient exceeding 5x10-15 ~~mm*°C~~ 1/°C and a maximum continuous heat resistance equal to at least 80°C, the expansion of the core being

obtained through the dilation of the material forming the core when the temperature of the ~~mould~~ mold is increased.

47. (withdrawn)

48. (currently amended) Method for fabricating a bicycle wheel hub, comprising the following steps:

- providing a heat expandable core,
- applying a number of layers of structural ~~fibre~~ fiber fabric incorporated in a plastic material matrix around the core to form a layered tubular body of predetermined shape and thickness around the core,
- arranging the core with the layered tubular body formed thereon in the cavity of a ~~mould~~ mold,
- increasing the temperature of the ~~mould~~ mold to a value sufficient to cause reticulation of the plastic material matrix,
- expanding the core due to the increase in temperature for applying a pressure on the tubular body inside the ~~mould~~ mold, and
- removing the tubular body from the ~~mould~~ mold and from the core, so as to obtain a bicycle hub formed of a single piece of structural ~~fibre~~ fiber material,

wherein the layers of fabric on the core comprise one or more fabric strips wrapped around at least one axially limited portion of the core, to confer thickness to the tubular body, as well as a plurality of fabric plies extending along the core axis, to confer resistance in the axial direction to the tubular body.

49. (withdrawn)

50. (currently amended) The method of claim 1, wherein the ~~mold~~ core comprises two end flanges.

51. (currently amended) The method of claim 50 wherein the end flanges apply pressure to the ~~core~~ tubular body to minimize axial expansion of the ~~core~~ tubular body.

52. (currently amended) The method of claim 51 wherein the pressure is applied by helical springs contained within the ~~flanges~~ mold.

53. (new) The method of claim 50 wherein axial expansion of the tubular body is minimized by applying pressure to the tubular body via the end flanges.